Alternative Bagasse Cogeneration (Greenhouse Gas Pollution Prevention [GEP] Project)

Location: Countrywide
Type: Bagasse cogeneration
Size: 9 cogeneration units expected to total about 200 MW capacity
Funding: Total: US$128,000,000
Private: US$120,000,000
Public: US$8,000,000
Objective: To reduce the emissions of greenhouse gases (GHGs) per unit of electricity generated by encouraging increased and efficient use of biomass fuels at sugar mill cogeneration facilities.
Duration: 1995–2003
Scale: Rural and urban

Summary

Six sugar mills installed with high-efficiency cogeneration units and using biomass/bagasse fuels generate 500 million kWh annually and offset 550,000 tons of carbon dioxide (CO_2) emissions. The bagasse-based cogeneration potential in India is estimated at 5,000 MW, with only 300 MW commissioned so far. The proven success of bagasse cogeneration will help ensure sustainability and help India achieve the 5,000 MW potential.

In-Country Principles That Attracted Nondonor Financing

- Capacity building and informed decision making
- Public participation in, and support of, sustainable development

Activities that support capacity-building and informed decision-making principles, which in turn can help attract private financing have included study tours, demonstration activities, seminars, and participation in international forums and workshops, which help increase awareness of commercial business practices, competitive energy market operation, and managing private sector involvement.

A central element of energy-sector reform efforts is increased public knowledge of and participation in energy decision making, which have been enhanced by professional training and outreach programs.

Government policies that supported private investment in sugar mill cogeneration for exporting electricity to the grid (for additional revenues) also contributed to private-sector participation.

Financing

Total cost is US$128,000,000. Private-sector sugar mills invested US$120,000,000. The United States Agency for International Development (USAID) contributed US$8,000,000 in grants and technical assistance.

The Project

The project is designed to reduce the emissions of GHG by encouraging increased and efficient use of biomass fuels at sugar-mill cogeneration facilities. (Cogeneration is the joint production of process steam, and bagasse is a waste product of sugar-cane processing.)

Under the project, nine sugar mills will set up high-efficiency cogeneration units using biomass and bagasse fuels. Six of these plants have already installed cogeneration units and are generating about 500 million kWh of electricity annually. Cogeneration units at the three remaining sugar mills are being commissioned in 2002.

Net CO_2 emissions from bagasse/biomass usage for energy are considered zero, because these fuels absorb CO_2 during their growth, and the corresponding CO_2 generation by fossil fuels is eliminated. Thus, the use of biomass/bagasse fuels in the six plants eliminates approximately 550,000 tons of CO_2 emissions per year.

The utility sector is the primary beneficiary of the project, but all sectors benefit from the increased provision of electricity using nonpolluting energy sources.

The project is also extending the merits of bagasse cogeneration to other biomass fuels year round, as many cogeneration developers use coal or lignite in the off season.

Implementing high-efficiency cogeneration at sugar mills and supplying the excess electricity to the grid is akin to distributed generation, and therefore minimizes transmission and distribution losses because of the local end use.

Technical Data

The sugar mills are switching to high-pressure/high-temperature-based cogeneration units and multifuel boilers with electrostatic precipitators.

Performance Data

The six sugar mills with completed installations are generating about 500 million kWh electricity annually and reducing CO_2 emissions by about 550,000 tons per year.

Participants and Roles

The Industrial Development Bank of India implements the project's investment-related activities, and the sugar mills provide the vast majority of funding. The US Department of Energy (USDOE) National Energy Technology Laboratory (NETL) provides technical assistance and training to Indian counterparts through Science Applications International Corporation (SAIC) and Winrock International India.

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